

GP 1752

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Ronald Sinclair Nohr et al.

Serial No. 09/407,007

Filed: September 28, 1999

For: Novel Photoinitiators and
Applications Therefor



Art Unit: 1752

Examiner:

Handwritten marks: a large 'X' and a smaller '4'.

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents

Washington, DC 20231

Sir:

The citation of information on the attached Form PTO-1449, "List of Art Cited by Applicant" is made pursuant to 37 C.F.R. §§ 1.97 and 1.98. A copy of each cited item is enclosed unless stated otherwise hereinbelow.

The above-referenced application is one of a group of patent applications dealing with various technical aspects of chemistry relating to chemical compounds and compositions that are capable of the capture and transfer of electromagnetic radiation and the uses of these compounds and compositions in photocuring and dye technology (hereinafter the "Technology"). These applications are listed on the attached Appendix A for your reference. Applicants respectfully request that the Examiner review the applications listed in Appendix A, initial Appendix A in the appropriate spaces, and return a copy of the initialized Appendix to Applicants.

Applicants have conducted the following searches for each of the following technical aspects of the Technology:

- State of the art search directed towards photocuring compositions and methods.

- State of the art search directed towards an arylketoalkene compound and methods for stabilizing colorants or generating reactive species using the same.
- State of the art search directed towards novel pre-dye and leuco pre-dye compositions and methods of developing color using the same.
- Patentability search directed to ink jet ink compositions
- Patentability search directed to mutable colorant compositions
- Patentability search directed to the use of mutable colorant compositions on machine readable forms.
- Patentability search directed to the use of mutable colorant compositions in dry imaging processes.
- Patentability search directed to the use of mutable colorant compositions in methods for storing information.
- Patentability search directed to dye stabilization with dehydrated phthaloylglycine-2959.
- Patentability search directed to dye stabilization by association with cyclodextrins.
- Patentability search directed to dye stabilization to light, or lightfastness to dyes.
- Patentability search directed to dye stabilization in general.

Although Applicants are under no duty to categorize the references disclosed herein, Applicants have made a good faith effort to do so in a manner most likely to assist the Examiner in his or her review of the references. To further assist the Examiner in his or her review of the enclosed references, those references that have been cited in Office Actions relating to the applications listed in Appendix A have a superscript identifying in which application of Appendix A the reference was cited. Further, those references that have been cited in Office Actions from any foreign country have a superscript identifying in which

application and country the reference was cited. To even further assist the Examiner, Applicants specifically direct the Examiner's attention to references having an asterisk as being of specific interest to the above-referenced application. Please note that the categorization of the references serves as the concise explanation of the relevance of any reference that is not in the English language as required under 37 C.F.R. § 1.98 (a)(3).

As all of the references found in the Applicants' searches and obtained from other sources relate to the overall research and development of the Technology, Applicants hereby cite the following references to discharge their duty under 37 C.F.R. § 1.56 to disclose all information known to the undersigned attorney and the Applicants that may be material to patentability:

The Following References Relate to Thermally, Mechanically, or Chemically Mutable Colorant Compositions that do not include Photoinitiators, Photosensitizers or Photoreactive Compositions

<u>Cited in:</u>	<u>U.S. Patents</u>		
	<u>PTO-1449</u> <u>No.</u>		
	102	5,372,917	Tsuchida et al.
	128	5,296,556	Frihart
	256	4,985,345	Hayakawa et al.
	337	4,720,450	Ellis
	352	4,663,641	Iiyama et al.
	357	4,638,340	Iiyama et al.
	392	4,460,676	Fabel



410	4,376,887	Greenaway et al.
412	4,373,020	Winslow
415	4,370,401	Winslow et al.
430	4,336,323	Winslow
463	4,262,936	Miyamoto
545	Re 28,225	Heseltine et al.
597	3,514,597	Haes et al.
674	2,364,359	Kienle et al.
716	1,436,856	Brenizer et al.



Foreign Patents

<u>Cited in:</u>	<u>PTO-1449</u>		
	<u>No.</u>		
	749	0639664	Europe
	848	63-48370	Japan
	858	61-222789	Japan

Other References

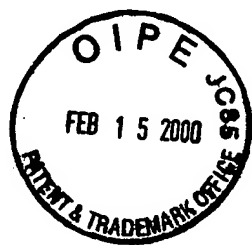
<u>Cited in:</u>	<u>PTO-1449</u>				
	<u>No.</u>				
	971	Abstract for WO 95/00343 - A1	Textiles: Paper: Cellulose	pg. 7	1995
	1042	"German company develops reuseable paper"	Pulp & Paper		1991

The Following References Relate to Colorant Stabilizers

**Colorant Stabilizers relating to Chalcones, Benzilidene
Acetones, and Extended Conjugation**

U.S. Patents

<u>Cited in:</u>	<u>PTO-1449</u>	<u>No.</u>	
	2	5,891,229	Nohr et al.
	8	5,885,337	Nohr et al.
	27	5,773,182	Nohr et al.
	42	5,700,850	Nohr et al.
	149	5,224,476	Schultz et al.
	156	5,221,334	Ma et al.
	175	5,190,565	Berenbaum et al.
	204	5,124,723	Hugh S. Laver
	220	5,085,698	Ma et al.
103	224	5,073,448	Vieira et al.
	283	4,902,787	Freeman
54	289	4,874,391	Reinert
	307	4,812,139	Brodmann
	315	4,775,386	Reinert et al.
	381	4,524,122	Weber et al.





547	3,840,338	Zviak et al.
662	2,628,959	von Glahn et al.
664	2,612,495	von Glahn et al.
676	2,356,618	Rossander et al.

Foreign Patents

PTO-1449

Cited in:

No.

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730	97/20000	PCT
837	63151946	Japan
845	6395439	Japan
846	6395440	Japan
920	4315663	Japan
934	552,565	Canada

Other References

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Cited in:

No.

1022	Abstract of patent, JP 03-220384	1991
1118	Derwent Publications Ltd., London, J,A, 0011451 (Fugi Photo Film KK), 1/21/85. (Abstract)	1985
1145	Derwent Publications Ltd., London, J,A, 0187289 (Honshu Paper Mfg KK), 11/17/82. (Abstract)	1982

19W 54W	1187	Karmanova,	"Light stabilizers of	Chemical	82	147 [no	1975
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			paints"				

Colorant Stabilizers relating to AryliminealkenesU.S. Patents

<u>Cited in:</u>	<u>PTO-1449</u>		
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	3	5,891,229	Nohr et al.
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Foreign Patents

<u>Cited in:</u>	<u>PTO-1449</u>		
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	817	271512	Germany

Other References

<u>Cited in:</u>	<u>PTO-1449</u>					
	<u>No.</u>					
	1114	John J. Eisch and Ramiro Sanchez	"Selective, Oxophilic Imination of Ketones with Bis (dichloroaluminum) Phenylimide"	J. Org. Chem.	51 (10)	1848-185 2

Colorant Stabilizers relating to Group VII IonsU.S. Patents

<u>Cited in:</u>	<u>PTO-1449</u>		
	<u>No.</u>		
	4	5,891,229	Nohr et al.
	10	5,885,337	Nohr et al.
45	310	4,803,008	Ciolino et al.
45	454	4,276,211	Singer et al.

Foreign PatentsPTO-1449Cited in:No.76W 117
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764	680915	Japan
823	89014948	Japan

Other ReferencesPTO-1449Cited in:No.

1128	Derwent Publications Ltd., London, J,A, 0053563 (Dainippon Toryo KK), 3/28/84. (Abstract)	1984
1129	Derwent Publications Ltd., London, J,A, 0053562 (Dainippon Toryo KK), 3/28/84. (Abstract)	1984
1133	Derwent Publications Ltd., London, J,A, 0051961 (Dainippon Toryo KK), 3/26/84). (Abstract)	1984
1208	Suppan, Paul "Quenching of Excited States"	Chemistry and Light 65-69

Colorant Stabilizers relating to Phenols Including Iodophenols and Derivatives Thereof

U.S. PatentsPTO-1449Cited in:No.

5	5,891,229	Nohr et al.
11	5,885,337	Nohr et al.
261	4,964,871	Reinert et al.

Foreign Patents

PTO-1449

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839	6395447	Japan
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841	6395445	Japan
842	6395448	Japan
843	6395449	Japan
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1198	Derwent World Patents Index,CS 120380 (Kocourek, Jan) 10/15/66.	1966
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Colorant Stabilizers relating to Reducing Agents

U.S. Patents

<u>Cited in:</u>	<u>PTO-1449</u>		
	<u>No.</u>		
	6	5,891,229	Nohr et al.
	12	5,885,337	Nohr et al.
	63	5,571,313	Mafune et al.
	68	5,531,821	Wu
	229	5,057,562	Reinert
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Colorant Stabilizers relating to Crown Compounds

U.S. Patents

<u>Cited in:</u>	<u>PTO-1449</u>		
	<u>No.</u>		
	7	5,891,229	Nohr et al.
67 103 109 76	15	5,855,655	Nohr et al.
67 103 109 76 102	26	5,782,963	Nohr et al.
	85	5,445,651	Thoen et al.
54 57	131	5,286,286	Winnik et al.

	133	5,282,894	Albert et al.
54 57	139	5,271,764	Winnik et al.
54 57	146	5,256,193	Winnik et al.
	246	5,017,195	Satou et al.
	260	4,966,607	Shinoki et al.
	286	4,892,941	Dolphin et al.
	303	4,834,771	Yamauchi et al.
	325	4,746,735	Kruper, Jr. et al.
	346	4,704,133	Reinert et al.
	367	4,614,723	Schmidt et al.
	404	4,400,173	Beavan
	507	4,077,769	Garcia
	588	3,579,533	Yalman
	624	3,248,337	Zirker et al.
	637	3,076,813	Sharp
	682	2,243,630	Houk et al.
	687	2,181,800	Crossley et al.



698	2,090,511	Crossley et al.
700	2,058,489	Murch et al.
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713	1,844,199	Bicknell et al.



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968	Kubat et al.	"Photophysical properties of metal complexes of meso-tetrakis (40sulphonatophenyl	J. Photochem. and Photobiol.	96	93-97	1996
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Colorant Stabilizers relating to UV Absorbers

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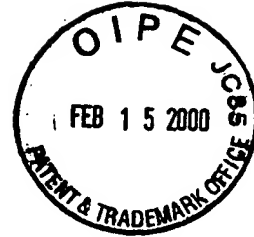
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73	5,498,345	Jollenbeck et al.
74	5,489,503	Toan
77	5,474,691	Severns
171	5,197,991	Rembold
180	5,181,935	Reinert et al.
218	5,089,050	Vieira et al.

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223	5,074,885	Reinert
238	5,030,243	Reinert
268	4,950,304	Reinert et al.
376	4,557,730	Bennett et al.
447	4,288,631	Ching
468	4,256,493	Yokoyama et al.
497	4,126,412	Masson et al.
502	4,105,572	Gorondy
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536	3,910,993	Avar et al.
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650	2,827,358	Kaplan et al.
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"Stereo-electronic effects in ring closure reactions: the 2'-hydroxychalcone - flavanone

Canadian J. Chem.

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Sakai et al.

"A Novel and Practical Synthetic Method of 3(2H)-Furanone Derivatives,"

J. Heterocyclic Chem.

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"Synthesis of Functionalized Tetrahydrofurans,"

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"Ascofuranone, an antibiotic from Ascochyta," Japan Kokai 73 91,278 (11/28/73)

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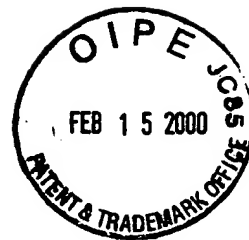
176	5,190,710	Kletecka
191	5,160,346	Fuso et al.
213	5,098,477	Vieira et al.
215	5,096,456	Reinert et al.
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222	5,076,808	Hahn et al.
226	5,069,681	Bouwknegt et al.
241	5,028,262	Barlow, Jr. et al.
266	4,952,680	Schmeidl
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306	4,813,970	Kirjanov et al.
321	4,761,181	Suzuki
336	4,721,531	Wildeman et al.
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380	4,523,924	Lacroix
431	4,335,055	Blaser et al.
433	4,318,705	Nowak et al.
441	4,301,223	Nakamura et al.
456	4,271,252	Hara et al.
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459	4,269,926	Hara et al.
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632	3,133,049	Hertel et al.
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651	2,809,189	Stanley et al.
653	2,773,056	Helfaer
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663	2,612,494	von Glahn et al.
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670	2,402,106	von Glahn et al.



671	2,386,646	Adams et al.
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677	2,349,090	Haddock
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696	2,106,539	Schnitzspahn
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715	1,744,149	Staehlin
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722	575,228	von Gallois



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879	2146357	United
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918	4726653	Japan
922	1240811	Germany
926	1132540	Germany
938	537687	Canada
939	517364	Canada
940	483214	Canada
941	465495	Canada
942	465496	Canada
943	465499	Canada
944	463022	Canada
945	463021	Canada
947	460268	Canada
959	399753	United
960	413257	Canada



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964	424756	Japan



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981	Derwent Publications Ltd., London, J,A, 5-230410 (Seiko Epson Corp), 9/7/93. (Abstract)	1993
987	Abstract of patent, JP 5-195450 (Nitto Boseki Co. Ltd), 8/3/93.	1993
1020	Derwent Publications, Ltd., London, JP 403269167 (Japan Wool Textile KK),	1991
1023	Patent Abstracts of Japan, JP 03184896 (Dainippon Printing Co Ltd.) 8/12/91.	1991
1031	Abstract of patent, JP 03-41165	1991
1043	Abstract of patent, JP 02289652	1990
1046	Patent Abstracts of Japan, JP 02141287 (Dainippon Printing Co Ltd.) 5/30/90.	1990
1069	Derwent Publications, Ltd., London, SU 1423656 (Kherson Ind Inst), 9/15/88	1988

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1070	Derwent Publications, Ltd., London, EP 0280653 (Ciba GeigyAG), 8/31/88 (Abstract)	1988
1073	Derwent World Patents Index, JP 63179977 (Tomoegawa Paper Mfg Co Ltd),	1988
1077	Derwent Publications, Ltd., London, J6 3112770 (Toray Ind Inc), 5/17/88 (Abstract)	1988
1078	Derwent Publications, Ltd., London, J6 3108074 (Konishiroku Photo KK), 5/12/88	1988
1079	Derwent Publications, Ltd., London, J6 3108073 (Konishiroku Photo KK), 5/12/88	1988
1082	Abstract of patent, JP 63-47762,	1988
1083	Abstract of patent, JP 63-47763,	1988
1084	Abstract of patent, JP 63-47764,	1988
1085	Abstract of patent, JP 63-47765	1988
1089	Derwent Publications, Ltd., London, J6 2270665 (Konishiroku Photo KK), 11/25/87	1987



1108		Derwent Publications, Ltd., London, J6 1041381 (Osaka Prefecture), 2/27/86 (Abstract)				1986
1119		Derwent Publications, Ltd., London J6 0011449 -A (Taoka Chemical KK) 1/21/85				1985
1121	Roos, G. et al.	"Textile applications of photocrosslinkable polymers"	Chemical Abstracts	103	57 [no. 103:2369 0j]	1985
1125		Derwent Publications Ltd., London, J,A, 0169883 (Ricoh KK), 9/25/84. (Abstract)				1984
1130		Derwent Publications Ltd., London, J,A, 0053562 (Dainippon Toryo KK), 3/28/84. (Abstract)				1984
1141		Derwent Publications, Ltd., London, EP 0072775 (Ciba Geigy AG), 2/23/83 (Abstract)				1983
1148		Derwent Publications, Ltd., London J5 7139146 (Showa Kako KK) 8/27/82 (abstract)				1982
1150		Derwent Publications, Ltd., London, JA 0061785 (Nippon Senka KK), 4/14/82 (Abstract)				1982
1167		Derwent Publications Ltd., London, J,A, 0004488 (Canon KK), 1/17/81. (Abstract)				1981



1171	Derwent Publications, Ltd., London CA 1086-719 (Sherwood Medical) 9/30/80	1980
1183	Derwent Publications Ltd., London, J,A, 0012037 (Pentel KK), 1/29/77. (Abstract)	1977
1191	Derwent Publications, Ltd., London J4 9131-226 (TNational Cash Register C) 12/16/74	1974
1195	Abstract of patent, NL 7112489 (12/27/71).	1971
1197	Derwent Publications, Ltd., London SU 292698-S 1/15/71 (abstract)	1971
1213	Abstract of Patent, JP 405195450	



Colorant Stabilizers relating to the use of Phthaloyl Compounds

U.S. Patents

PTO-1449

Cited in:

No.

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West

Foreign Patents

PTO-1449

Cited in:

No.

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889

57171775

Japan

**The Following References Relate to Photoinitiators, Photosensitizers
or Photoreactive Compositions Generally**

References with a photoinitiator and a chromophore or sensitizer therein. These references will contain the combination of a compound that specifically absorbs light energy and then transfers it to the photoinitiator.

		<u>U.S. Patents</u>	
<u>Cited in:</u>		<u>PTO-1449</u>	<u>No.</u>
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68		19	5,811,199 MacDonald et al.
68		22	5,798,015 Nohr et al.
68		29	5,747,550 Nohr et al.
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		35	5,721,287 Nohr et al.
68		38	5,709,955 Nohr et al.
68		44	5,685,754 Nohr et al.
44 48 68		67	5,532,112 Kohler et al.
34 42 31 20 29 35 66		82	5,455,143 Ali
		* 93	5,415,976 Ali
		100	5,376,503 Audett et al.
17 11		106	5,362,592 Murofushi et al.
26 30 37 41 60 100 10 73		110	5,340,631 Matsuzawa et al.
		111	5,340,854 Martic et al.



	* 113	5,334,455	Noren et al.
	118	5,312,721	Gesign
	120	5,312,713	Yokoyama et al.
	127	5,296,275	Goman et al.
18 23 25 28 39 21	136	5,275,646	Marshall et al.
6 14 68	143	5,262,276	Kawamura
	145	5,258,274	Helland et al.
112 WP	152	5,230,982	Davis et al.
	155	5,224,197	Zanoni et al.
	158	5,219,703	Bugner et al.
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	172	5,196,295	Davis
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	179	5,185,236	Shiba et al.
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210	5,106,723	West et al.
211	5,098,806	Robillard
217	5,089,374	Saeva
231	5,053,320	Robbillard
233	5,047,556	Kohler et al.
234	5,045,573	Kohler et al.
* 235	5,045,435	Adams et al.
240	5,028,792	Mullis
249	5,002,993	West et al.
251	5,003,142	Fuller
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	270	4,937,161	Kita et al.
	271	4,942,113	Trundle
	274	4,925,770	Ichiura et al.
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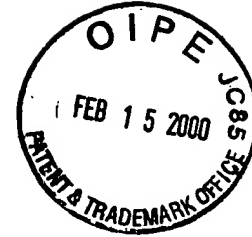
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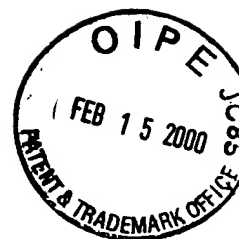
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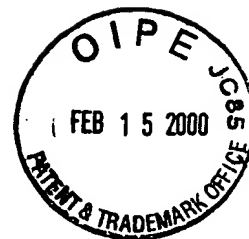


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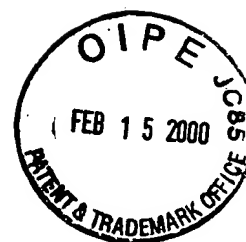
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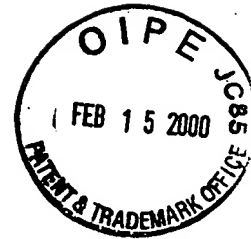
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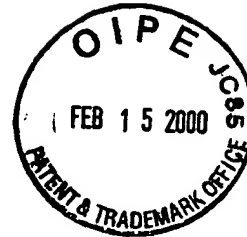
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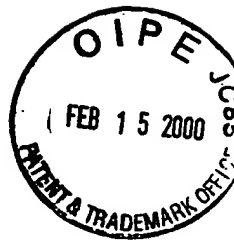
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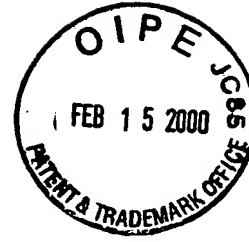
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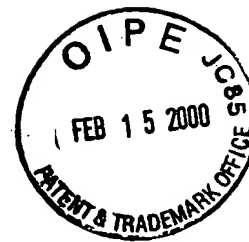
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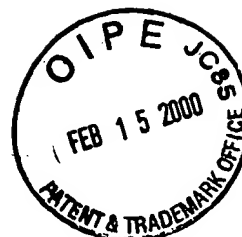
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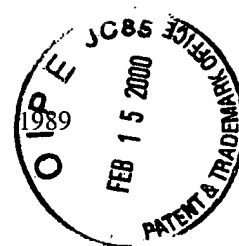
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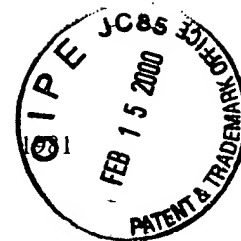
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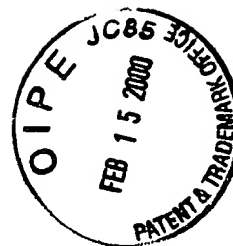


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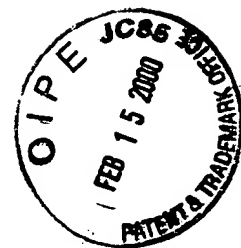
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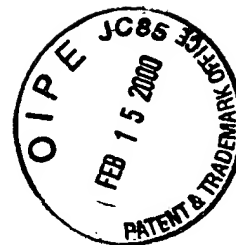
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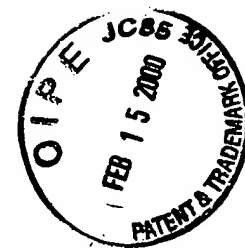
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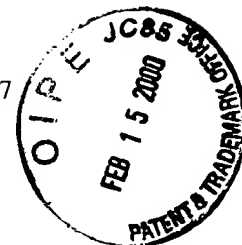
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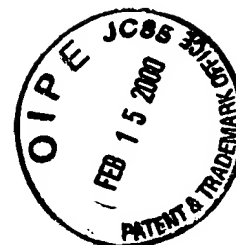


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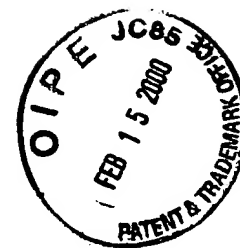
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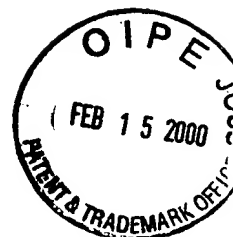
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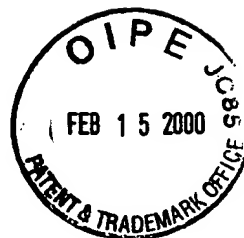
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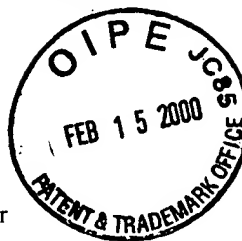
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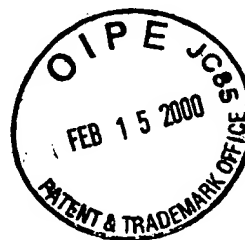
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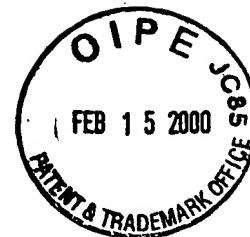
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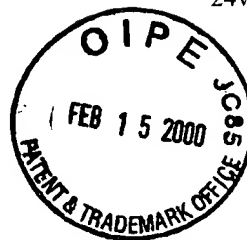
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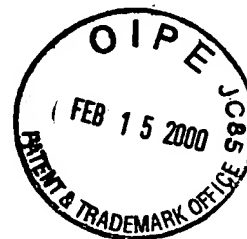
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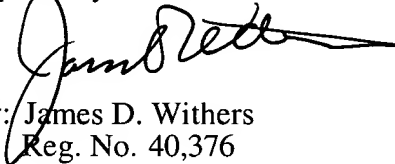
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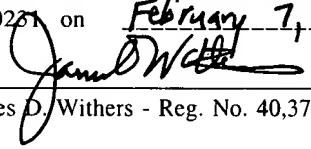
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